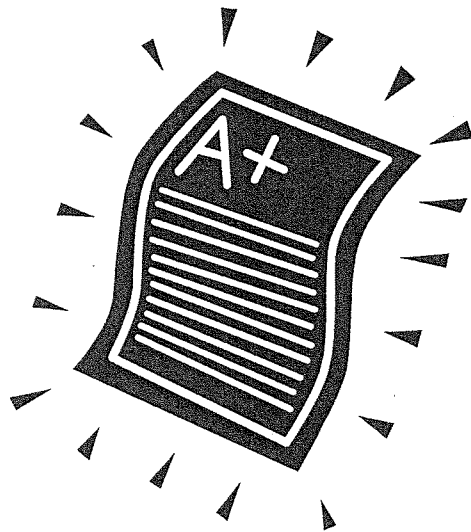


Science 7

Final Exam

Review Packet



Name _____

Date _____

Period _____

Book A - Chapter 1

- List the 7 steps of the scientific method

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.

- Measuring w/scientific units

Write the instrument you'd use to measure the following...

- Temperature = _____
- Mass = _____
- Volume = _____

- Graphing

- Classification

- List the 6 kingdoms and an example of an organism from each.

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

- Using a dichotomous key

Book A - Chapter 2

- All living things are made up of _____.
- Cell organelles & functions
 - Chloroplast - _____
 - Cell wall - _____
 - Mitochondria - _____
 - Nucleus - _____
 - Ribosome - _____
 - Vacuole - _____
- organelle → cell → tissue → organ → organ system → organism
- Vaccine - dead or weakened forms of a disease injected to give you immunity

Book A - Chapter 3

- Photosynthesis
 - Plants only
 - Occurs in the chloroplast
 - Write the formula below:

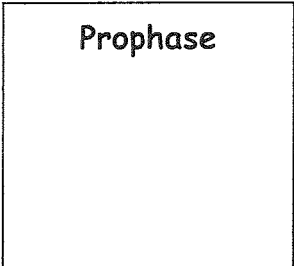
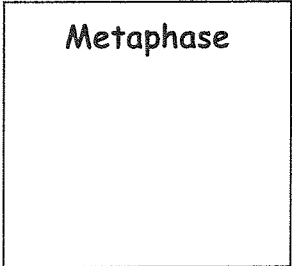
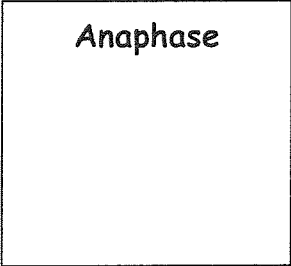
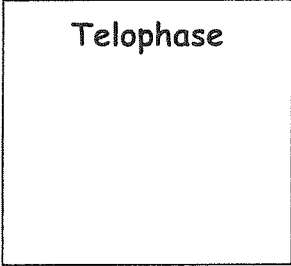
_____ + _____ + sunlight → _____ + _____

- Respiration
 - Plant and animal cells
 - Occurs in the mitochondria
 - Write the formula below:

_____ + _____ → _____ + _____ + ATP

Book A - Chapter 4

- Cell cycle/mitosis
 - In the boxes below, sketch what each phase of mitosis looks like:

Prophase	Metaphase	Anaphase	Telophase
			

- Asexual reproduction (budding & regeneration)
 - Offspring are identical to parents
- Sexual reproduction
 - Egg and sperm join together in the process of _____
 - A zygote is a fertilized egg.
- Diploid cell vs. Haploid cell
 - Diploid have a full set of chromosomes (Example: humans = 48)
 - Haploid have half a set of chromosomes (Example: humans = 23)
- DNA
 - Write the other side of the DNA molecule listed below:
 - AACTAGGT → _____
- Traits are controlled by _____.
- Mutations - change in a DNA sequence

Book A - Chapter 5

- Heredity - passing on of traits from parents to offspring
 - Hybrid/heterozygous (Aa)
 - Purebred/homozygous (AA or aa)
 - Dominant (AA or Aa)
 - Recessive (aa)
 - Genotype - genetic make-up (AA, aa, or Aa)
 - Phenotype - physical characteristic (brown fur or white fur)
 - Punnett Squares
-

Book A - Chapter 6

- Evolution - gradual change in a species over time
- Natural selection - the organisms with the best traits survive, reproduce and pass those traits on to their offspring
- Camouflage - adaptation in which an organism blends in with its surroundings
- Fossils - found in sedimentary rock (oldest layers are on the bottom)

Book B - Chapter 2

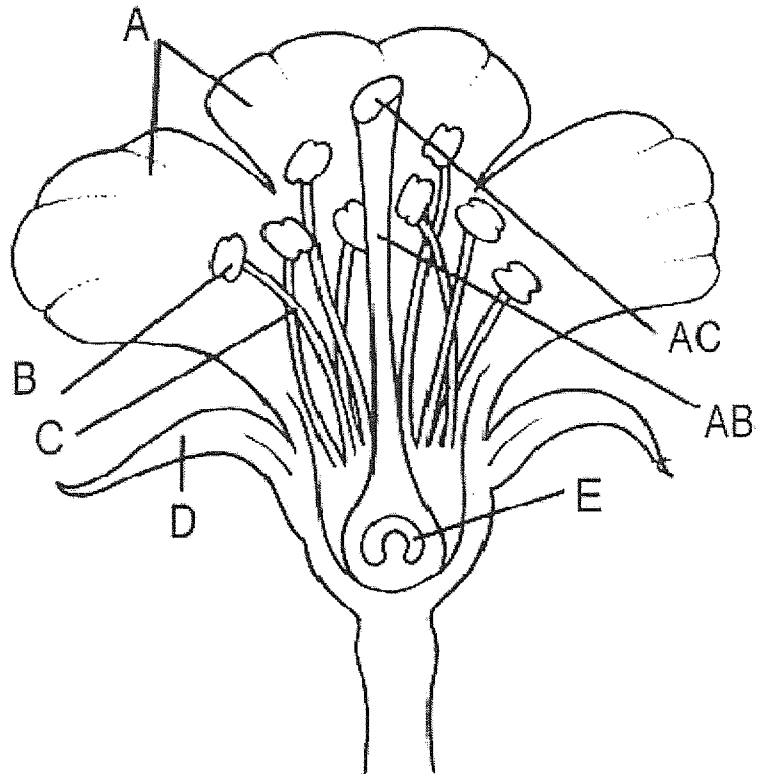
- Protists - can be plant like, animal like or fungus like
 - Fungi - are _____, meaning they get their energy from feeding off dead organisms
-

Book B - Chapter 3

- Plants
 - Roots - absorb _____ and _____
 - Stems - transport materials
 - Leaves - where photosynthesis occurs
- Plant reproduction

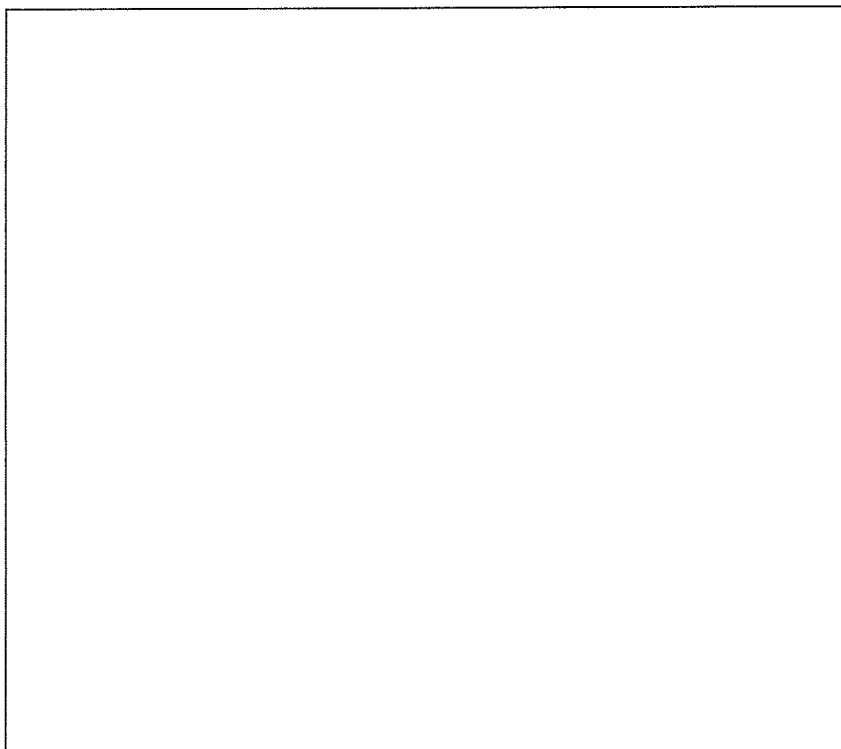
LABEL THE PARTS OF THE FLOWER:

A _____
B _____
C _____
D _____
E _____
AB _____
AC _____



Book K - Chapter 1

- The smallest unit of matter is the _____.
- Elements / periodic table
 - Be able to draw a Bohr model
 - 1st level = 2 electrons
 - 2nd level = 8 electrons
 - 3rd level = 18 electrons
 - Draw an atom of the element Boron in the box below.



- Be able to draw an electron dot diagram
 - Draw dots for the valence electrons
 - Start at the top and work clockwise
- Compounds
 - 2 or elements chemically combined
 - Examples: _____
- Mixtures
 - 2 or more substances - NOT chemically combined
 - Heterogeneous examples: _____
 - Homogeneous examples: _____

Book K - Chapter 2

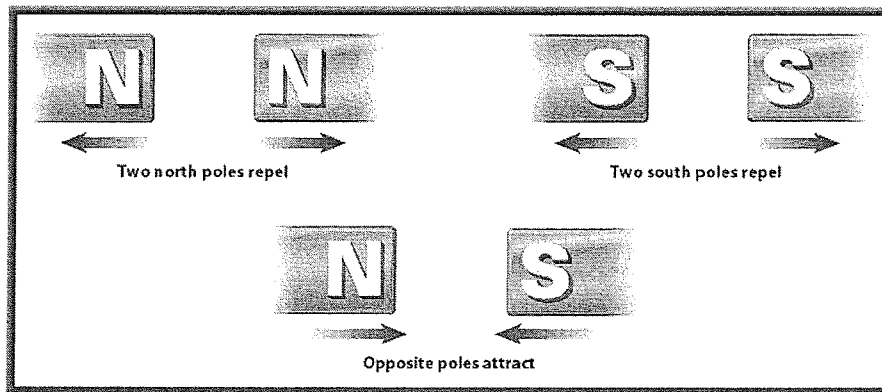
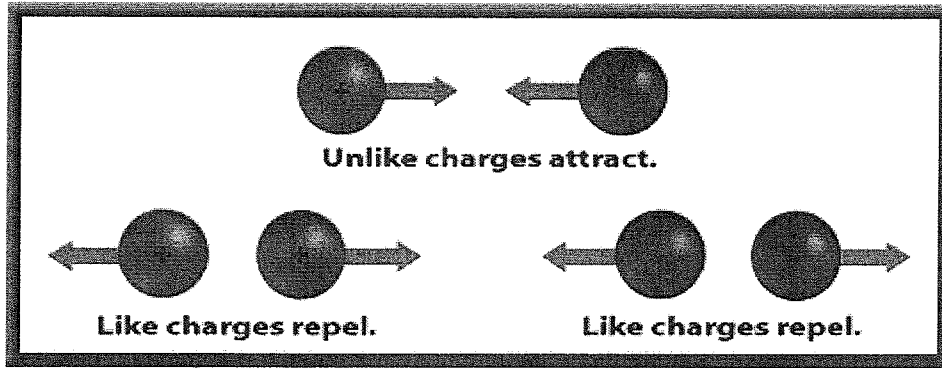
- States of matter (solid, liquid, gas)
 - Phase changes
 - Liquid → Solid = _____
 - Solid → Liquid = _____
 - Liquid → Gas = _____
 - Gas → Liquid = _____
 - Density
 - $D = m/v$
 - An object with a larger density than the liquid it's in will float.
-

Book K - Chapter 3

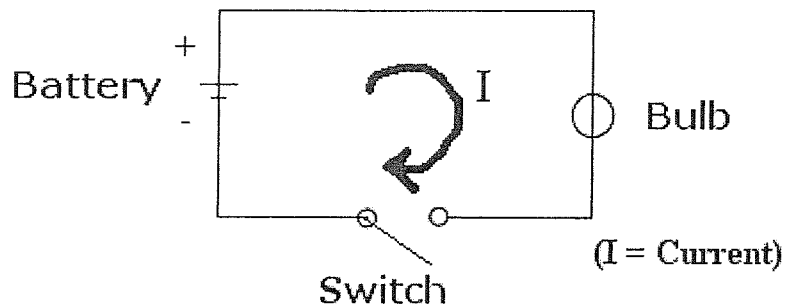
- Physical Changes
 - Change of state
 - Dissolving
 - Change in shape/size
- Chemical Changes
 - Rusting/corrosion/tarnish
 - Burning/cooking/baking
 - Bubbles/fizzing (gas)
 - Energy (gained or released)

Electricity & Magnetism

- Opposites attract!!!!
 - Electrical
 - Magnetic
- Circuits
 - Current can't flow if a switch is open

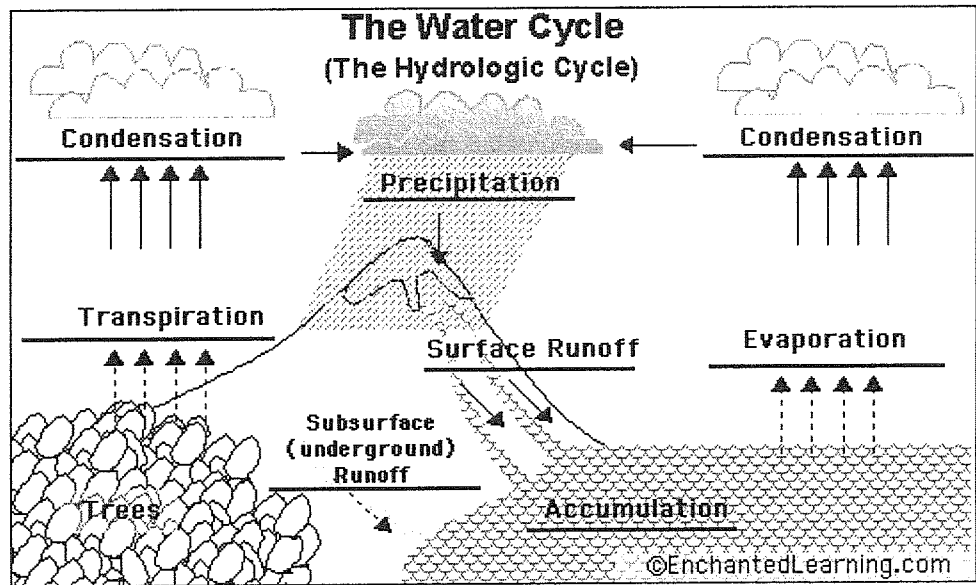


Schematic Diagram of a Simple Circuit

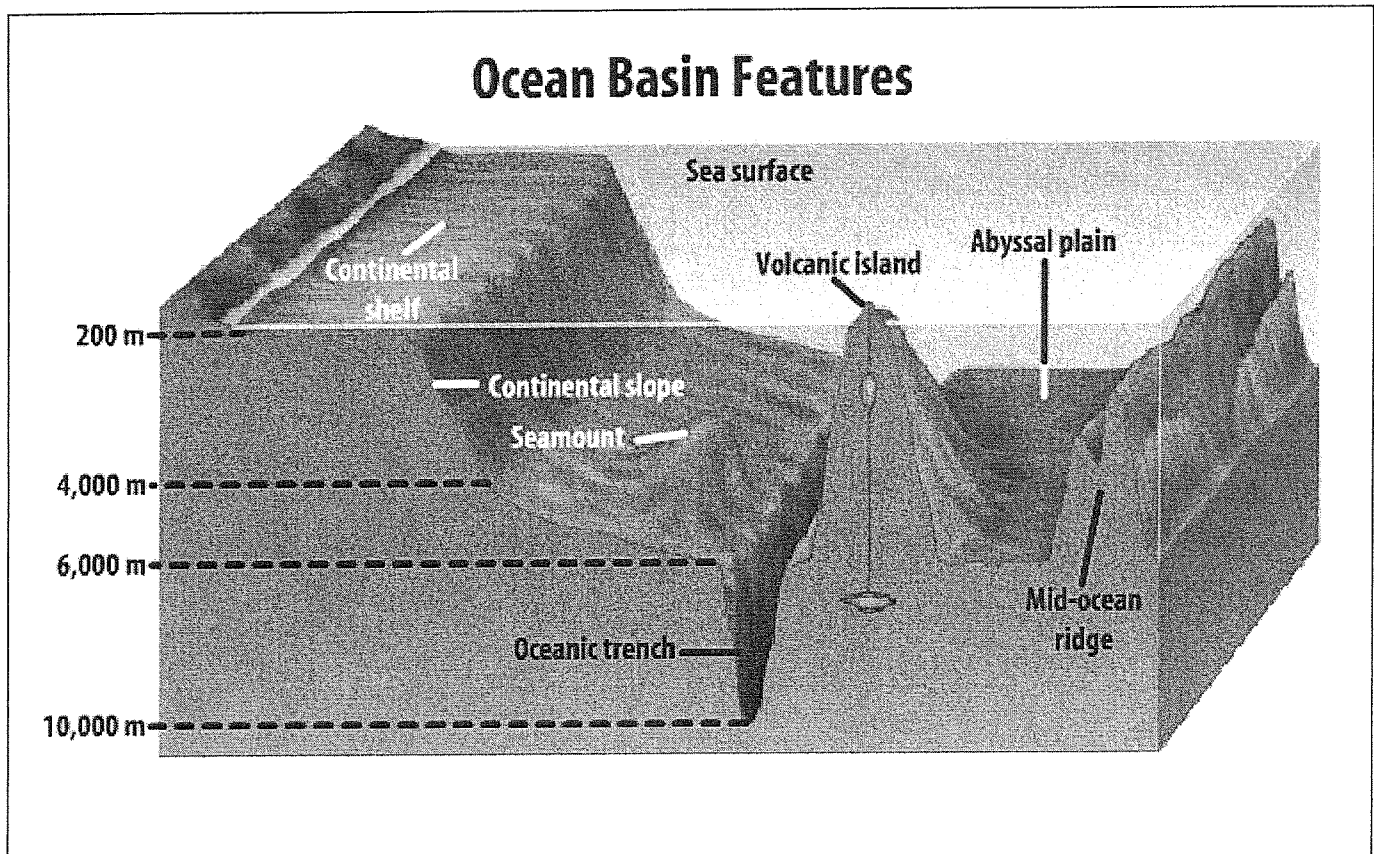


Book H - Chapters 1 & 5

- The Water Cycle



- Ocean floor



Practice Questions...

1. In which process is oxygen used to release the energy stored in food?

- (1) photosynthesis (3) digestion
(2) respiration (4) reproduction

2. Chromosome is to nucleus as DNA is to

- (1) cytoplasm (3) cell membrane
(2) gene (4) chloroplast

3. In sexual reproduction, what fraction of genes does each parent contribute to the offspring?

- (1) $\frac{1}{4}$ (3) $\frac{1}{2}$
(2) $\frac{1}{3}$ (4) $\frac{3}{4}$

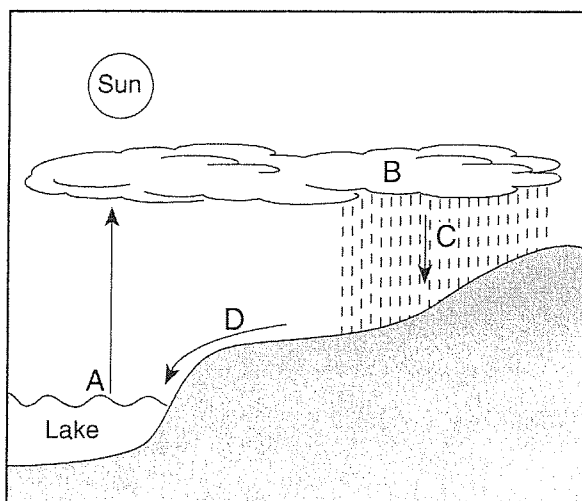
4. The fur of a snowshoe rabbit changes to white during the winter. This change is an example of

- (1) adaptation (3) metamorphosis
(2) competition (4) metabolism

5. The male sex cell is the

- (1) egg (3) sperm
(2) ovary (4) testes

6. The diagram below shows the water cycle.



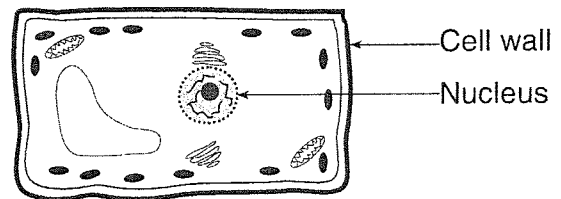
Which letter represents the process of evaporation?

- (1) A (3) C
(2) B (4) D

7. Which equipment will best separate a mixture of iron filings and black pepper?

- (1) magnet (3) triple-beam balance
(2) filter paper (4) voltmeter

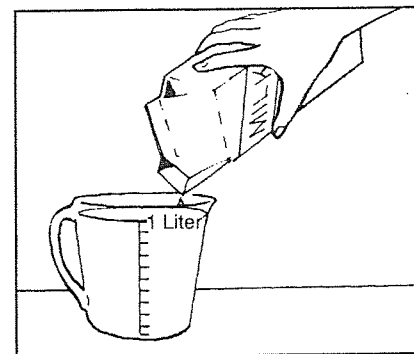
8. The diagram below shows a cell.



This cell would be found in which type of organism?

- (1) animals (3) viruses
(2) fungi (4) plants

9. The diagram below shows milk being poured into a measuring cup.



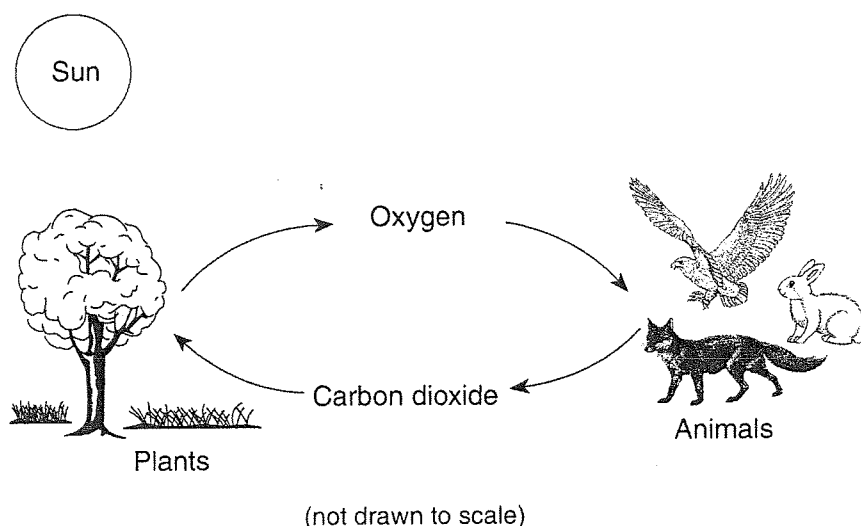
Which property of the milk can be directly measured using the cup?

- (1) mass (3) solubility
(2) density (4) volume

10. Tissue is composed of a group of

- (1) similar cells working together
(2) different organs working together
(3) organ systems working together
(4) nuclei in a cell working together

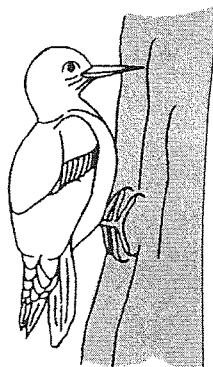
11 The diagram below gives information about carbon dioxide and oxygen in the atmosphere.



What is the name of the process represented in this diagram that produces the oxygen?

- | | |
|--------------------|-------------------|
| (1) photosynthesis | (3) respiration |
| (2) metamorphosis | (4) fertilization |

12 The drawing below shows a woodpecker using its long, sharp beak to obtain insects.



What factor might contribute to the extinction of this species of woodpecker?

- (1) a new source of food
- (2) an overabundance of trees
- (3) the use of pesticides in the forest
- (4) an increase in the population of insects

13 Which condition is the result of abnormal cell division?

- | | |
|---------------|----------------|
| (1) cancer | (3) infection |
| (2) pregnancy | (4) extinction |

14 Which process gives rise to a variety of traits within a species?

- (1) sexual reproduction
- (2) dynamic equilibrium
- (3) cellular respiration
- (4) internal regulation

15. Which model is used by scientists to determine the properties of elements?

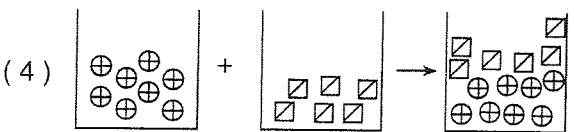
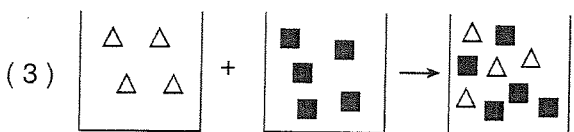
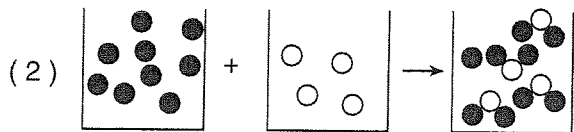
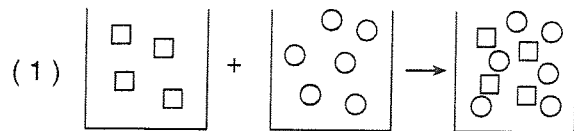
- | | |
|------------------------|----------------------|
| (1) a Punnett square | (3) a pedigree chart |
| (2) the Periodic Table | (4) the rock cycle |

17. Draw an electron dot diagram for the element Nitrogen.

16. Hydrochloric acid is added to a beaker containing a piece of zinc. As a result, zinc chloride is formed and hydrogen gas is released. This is an example of

- | | |
|-------------------------|--------------------|
| (1) a chemical reaction | (3) photosynthesis |
| (2) a physical change | (4) evaporation |

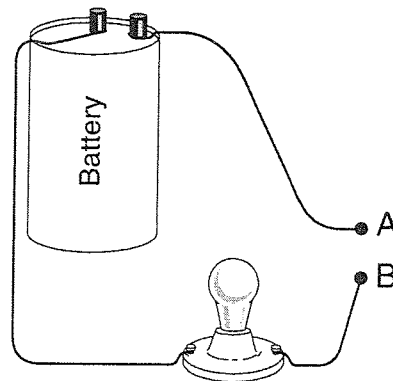
18. The four diagrams below model the results of mixing atoms of different substances. Each atom is represented by a different symbol. Which diagram correctly models a chemical change?



20. The tiny particles that make up all matter are called

- (1) genes (3) minerals
(2) atoms (4) cells

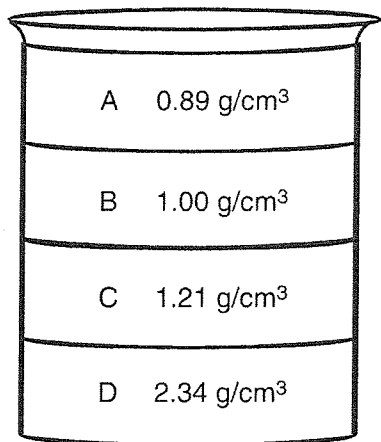
21. The diagram below shows an *incomplete* circuit.



Which item would allow the bulb to light up if it were used to connect point A to point B?

- (1) a glass rod (3) a plastic comb
(2) a metal coin (4) a paper cup

19. The diagram below shows a tall beaker with four different liquids and their densities.



If a ball that has a density of 1.73 g/cm^3 is placed in the beaker, where will the ball come to rest?

- (1) on top of liquid A
(2) between liquids B and C
(3) between liquids C and D
(4) on the bottom of the beaker

22. Magnets A and B are of equal magnetic strength. In which position will magnets A and B have the greatest attractive force toward each other?

- (1)
- (2)
- (3)
- (4)

23. The data table below shows the masses and volumes of three objects (A, B, and C).

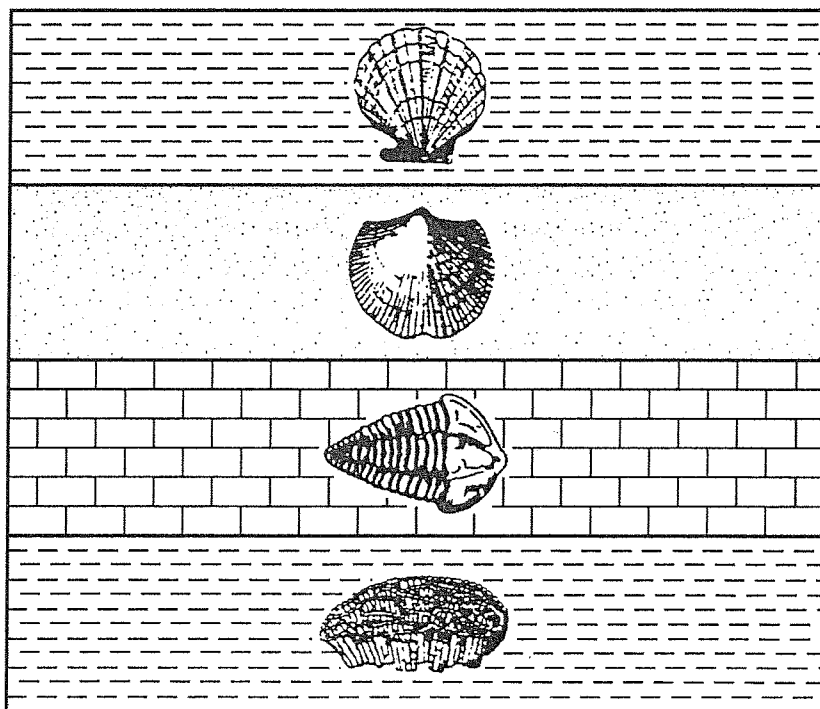
A	B	C
Mass = 4g	Mass = 6 g	Mass = 8 g
Volume = 2 cm ³	Volume = 6 cm ³	Volume = 4 cm ³

The formula for calculating an object's density is: $\text{Density} = \frac{\text{Mass}}{\text{Volume}}$.

Which statement about the densities of these three objects is correct?

- 1 B is more dense than A.
- 2 A is more dense than C.
- 3 B and C have equal densities.
- 4 A and C have equal densities.

24. The cross section below shows sedimentary rock layers containing fossils.



Assuming that these rock layers have not been overturned, which fossil is in the layer that was formed most recently?



(1)



(2)



(3)

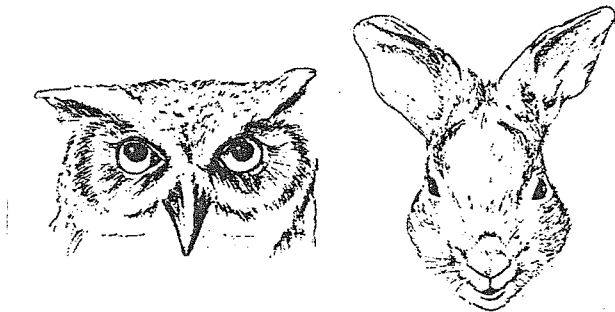


(4)

25. Water vapor changes to liquid water during which process?

- (1) dissolving
- (2) melting
- (3) evaporation
- (4) condensation

26. The eyes of the owl and the rabbit shown in the diagram below give each animal a different advantage. The front-facing owl eyes allow the bird to accurately judge distance when swooping in on prey. The side-facing rabbit eyes allow the animal to detect the motion of possible predators.



The specialized eye types of these animals are examples of

- (1) disruptions of the natural balance
- (2) the interdependence of living things
- (3) adaptations for survival under certain conditions
- (4) involuntary responses to stimuli

27. Which disease is a result of abnormal cell division?

- (1) AIDS
- (2) cancer
- (3) chicken pox
- (4) common cold

28. A change in the environment that causes a response is known as a

- (1) stimulus
- (2) habit
- (3) reflex
- (4) source

29.

c Identify *two* factors that will need to be held constant in the experiment.

(1)

(2)

b Identify the dependent (responding) variable in the experiment.

a Identify the independent (manipulated) variable in the experiment.

A student goes skateboarding a few times a week. The student notices that she can go faster while skating on some level surfaces than on others. She hypothesizes that speed has something to do with the surface she is skating on. The student wants to design an experiment to test this hypothesis.

30. A student wants to design a controlled experiment to solve the following problem:

When placed in a freezer, will hot water or cold water reach 0°C faster?

The student plans to place two containers with equal masses of water (one hot and one cold) in the same freezer in the classroom.

a List **three** conditions the student should keep constant for the hot-water and cold-water setups when planning this experiment.

b For **each** condition you name, give a scientific reason why the condition needs to be the same for both the hot-water and cold-water setups.

a Condition to be held constant	b Reason
(1)	(1)
(2)	(2)
(3)	(3)

31. Complete the Punnett square provided below to show the crossing of two *Rr* parents.

If 100 offspring were produced from the crossing shown in the Punnett square below, approximately how many would have a wrinkled pod shape? _____

	<i>R</i>	<i>r</i>
<i>r</i>	<i>Rr</i>	<i>rr</i>
<i>r</i>	<i>Rr</i>	<i>rr</i>

Key

R = full, round pod shape (dominant)

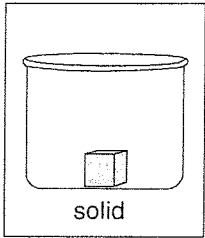
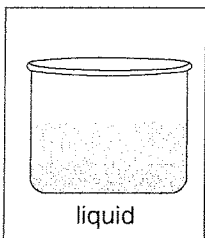
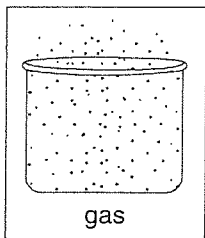
r = wrinkled pod shape (recessive)

32. The table below provides some information about common plant cell structures and their functions. In the table, there are three blank spaces. Fill in the three blank spaces by writing the name of the plant cell structure that performs the function described.

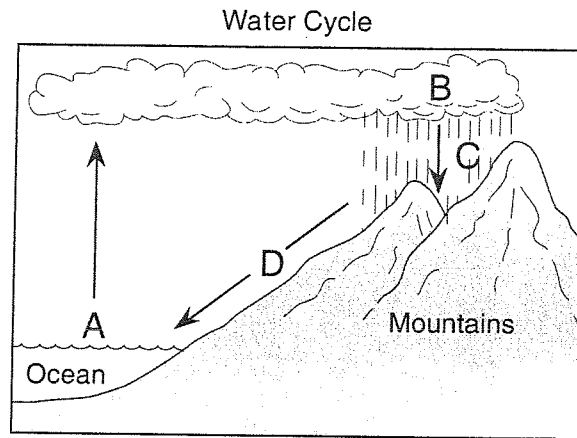
Plant Cell Structures and Their Functions

Plant Cell Structure	Function
Cell membrane	Allows substances to enter and leave the cell
	Directs the cell's activities including reproduction
	Captures energy from sunlight to make food
	Protects and supports the cells
Cytoplasm	Allows the movement of materials around the cell and supports other cell structures
Vacuole	Stores food, water, and waste

33. The drawings on the top row of the chart below represent water in its three phases (solid, liquid, and gas) in open containers. Complete this chart by filling in the answers that correspond to the drawing at the top of each column and the question in each row. Make sure you fill in an answer in every empty box.

	 <p style="text-align: center;">solid</p>	 <p style="text-align: center;">liquid</p>	 <p style="text-align: center;">gas</p>
Does this phase of matter have a definite shape? Write Yes or No in each box.			
Does this phase of matter have a definite volume? Write Yes or No in each box.			
How do these phases rank in order of the relative speed of their particles? Rank them 1, 2, 3 , with 1 having the slowest particles and 3 having the fastest particles.			

34. The diagram below uses letters A, B, C, and D to represent processes occurring in a water cycle.



In the chart below, identify the process that is occurring at each letter in the diagram. Select the process from the list below.

Processes
condensation
evaporation
precipitation
runoff

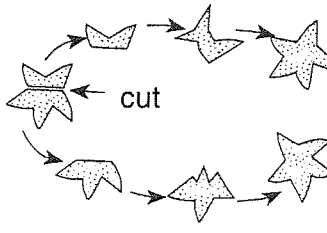
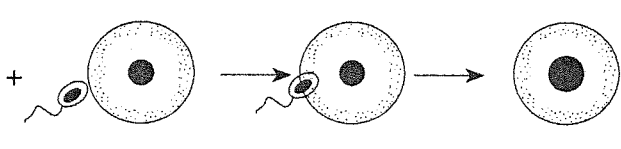
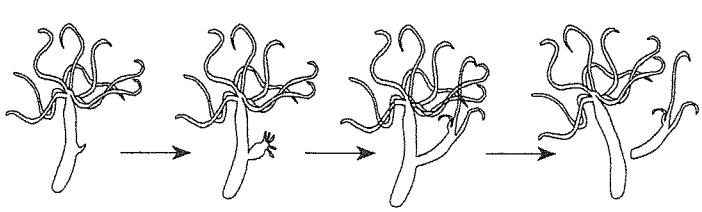
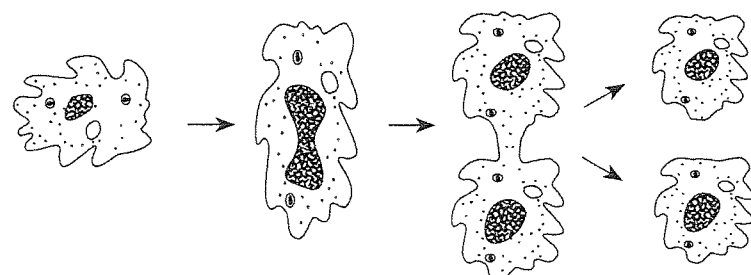
Letter	Process That Is Occurring
A	
B	
C	
D	

35. A student is given a mixture of salt, sand, and iron filings. Explain *two* laboratory methods that the student could use to physically separate some of these substances.

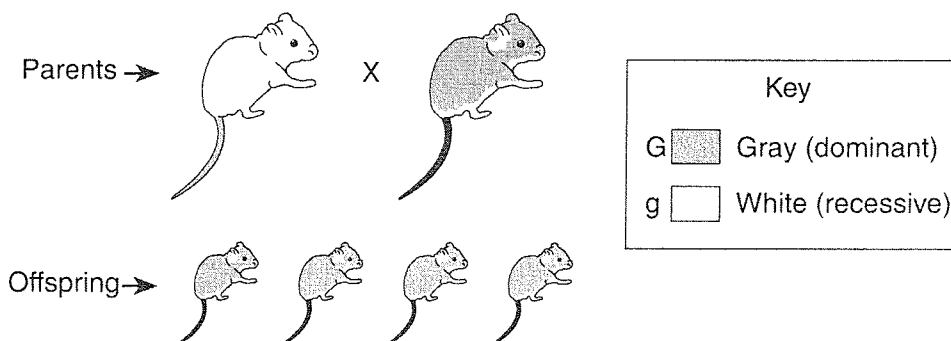
(1) _____

(2) _____

36. The diagrams in the first column of the chart below show various forms of reproduction. In the second column, circle the form of reproduction (asexual or sexual) shown by each of the diagrams.

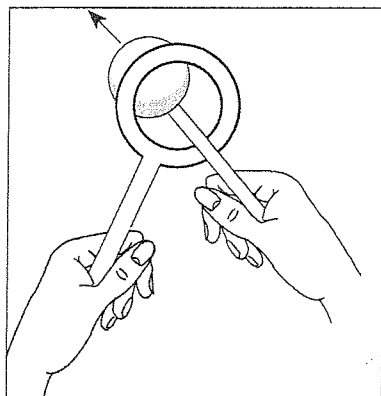
	<p>Asexual</p> <p>Sexual</p>
	<p>Asexual</p> <p>Sexual</p>
	<p>Asexual</p> <p>Sexual</p>
	<p>Asexual</p> <p>Sexual</p>

Base your answers to questions 37 and 38 on the diagram below. The diagram shows the offspring of a white mouse and a gray mouse. All of the offspring are gray.

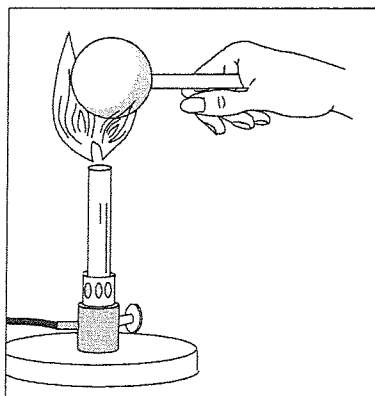


37. Which is a correct gene combination for the parents shown in the diagram?
- (1) $GG \times GG$
 - (2) $gg \times gg$
 - (3) $gg \times GG$
 - (4) $Gg \times Gg$
38. If two gray (Gg) mice mated, what percent of their offspring would have pure white fur?
- (1) 25%
 - (2) 50%
 - (3) 75%
 - (4) 100%

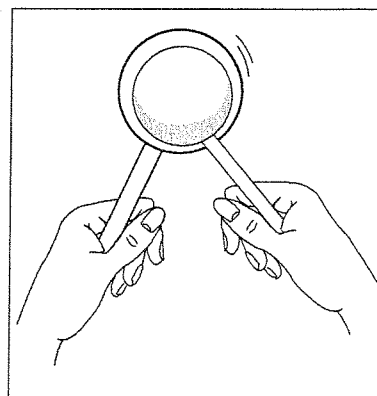
39. The illustration below shows a solid metal ball and a ring before and after heat is applied to the metal ball. Before heat is applied, the metal ball passes easily through the ring. After heat is applied, the metal ball does *not* pass through the ring.



Before heating metal ball



Heating metal ball



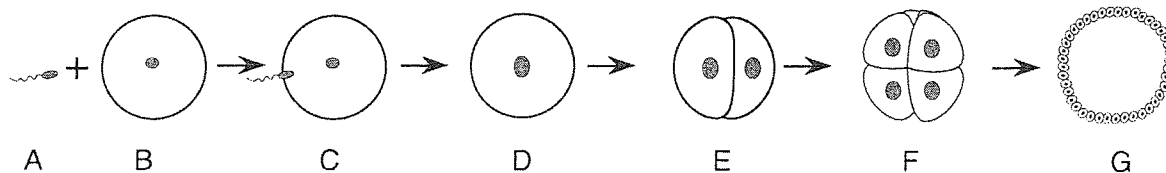
After heating metal ball

- a What evidence shows that a physical change took place in the metal ball?

- b Explain why heating the metal ball caused this physical change.

- c Explain why this is *not* evidence of a chemical change.

Base your answers to questions 40 through 43 on the diagram below which shows the process of sexual reproduction.



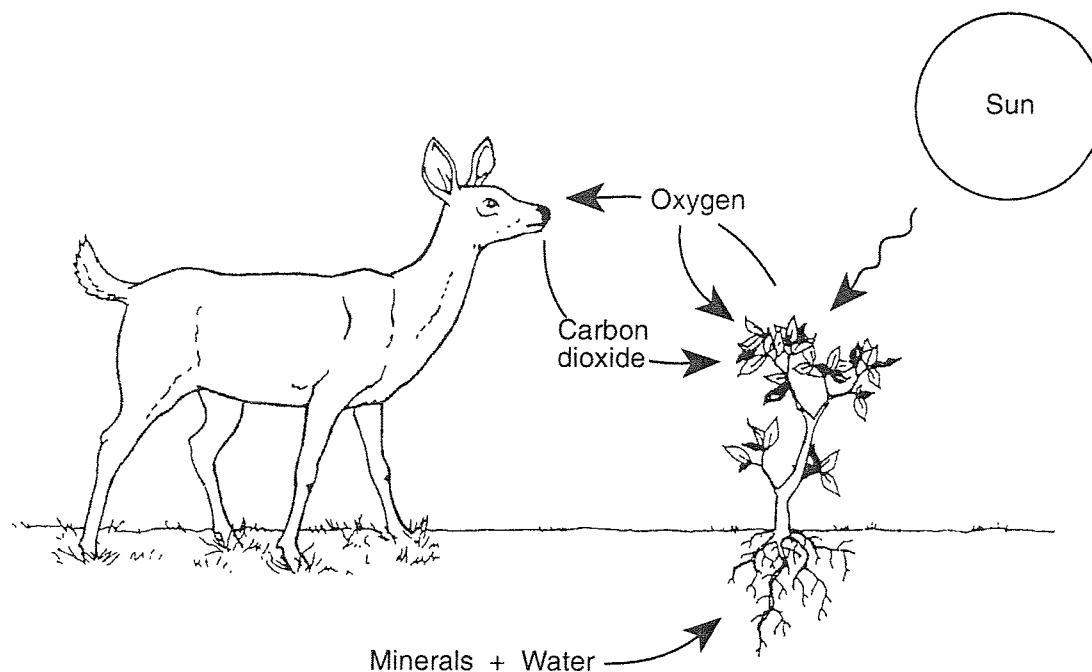
40. Identify the sex cell shown at A. _____

41. Identify the sex cell shown at B. _____

42. Identify the reproductive process that is occurring at C. _____

43. Identify the process that is occurring between E and F. _____

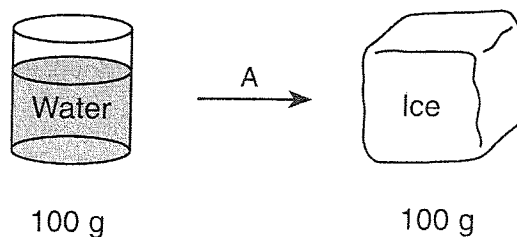
Base your answers to questions 44 and 45 on the diagram below and on your knowledge of science. The diagram below shows some relationships within a natural community.



44. Which statement best explains the relationships shown?
- (1) Water changes over time to a nonrenewable resource.
 - (2) Living things exchange materials with their environment.
 - (3) Minerals recycle the dead materials in the environment.
 - (4) Living things produce other living things.

45. Which process produces oxygen that is released into the atmosphere?
- (1) respiration
 - (2) locomotion
 - (3) excretion
 - (4) photosynthesis

Base your answers to questions 46 through 47 on the diagram below and on your knowledge of science. The diagram shows a phase change represented by letter A.

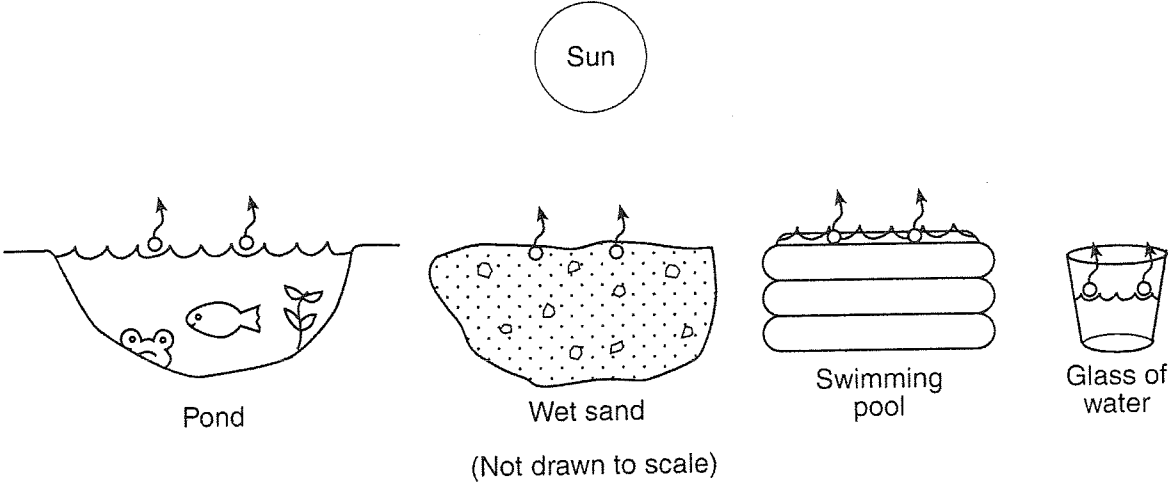


(Not drawn to scale)

46. State the term for the phase change that occurs at A.

47. Explain why the phase change at A is a physical change.

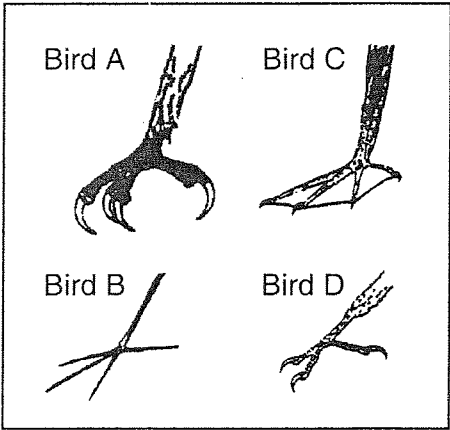
Base your answers to questions 48 and 49 on the diagrams below and your knowledge of science. The diagrams show liquid water changing to water vapor in four different situations.



48. Which observation would be evidence that the water is undergoing a phase change?
- (1) Waves form on the top of the pond.
 - (2) Water soaks into the wet sand.
 - (3) The water splashes out of the swimming pool.
 - (4) The water level in the glass of water decreases.
49. How is heat energy transferred within the liquid water in the pond?
- (1) compound formation
 - (2) convection currents
 - (3) chemical reactions
 - (4) nuclear reactions

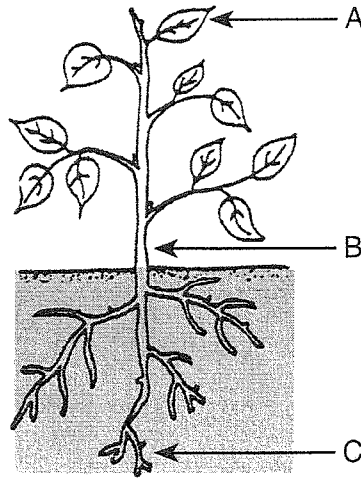
Base your answers to questions 50 and 51 on the drawings of bird feet and the dichotomous key below.

A Key to Identifying Birds		
Couplet	Description	
1a	Toes webbed	go to 2
1b	Toes not webbed	go to 3
2a	Four toes webbed together	cormorant
2b	Three toes webbed together	duck
3a	Claws curved	go to 4
3b	Claws not curved	jacana
4a	Claws large	eagle
4b	Claws small	kingfisher



50. Bird B is correctly identified as
- (1) a cormorant
 - (2) a duck
 - (3) an eagle
 - (4) a jacana
51. What is a common feature of both the eagle and the kingfisher?
- (1) claws large
 - (2) claws curved
 - (3) three toes webbed together
 - (4) four toes webbed together

52. The diagram below shows a bean plant.



Complete the chart below by identifying the *three* structures labeled A, B, and C. Identify one function of each structure.

Letter	Plant Structure	Function of Structure
A		
B		
C		

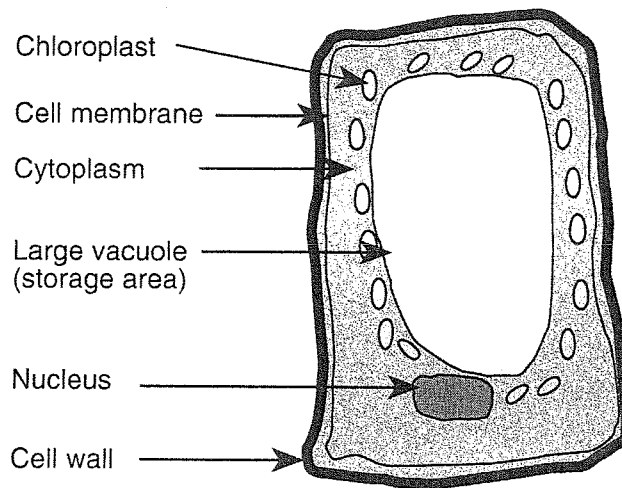
Base your answers to questions 53 through 54 on the information below and on your knowledge of science.

A student adds a mixture of oil, sand, and salt to a beaker of water and stirs. The student stops stirring and observes that the salt is no longer visible, the oil floats to the top, and the sand sinks to the bottom of the beaker.

53. Explain why the oil floats after the stirring stops.

54. Explain why the salt is no longer visible after the stirring stops.

Base your answers to questions 55 and 56 on the diagram below and on your knowledge of science. The diagram shows a cell with some basic cell structures labeled.



55. Identify *two* structures labeled in the diagram, other than the large vacuole, that indicate this cell is a plant cell.

(1) _____

(2) _____

56. Which hereditary material in the nucleus of the cell is responsible for passing traits on to the next generation?

Base your answers to questions 57 through 60 on the information and chart below.

The chart below shows temperature readings recorded every minute while a substance was being heated at a constant rate. The material was a solid before heating and a hot liquid after 7 minutes of heating.

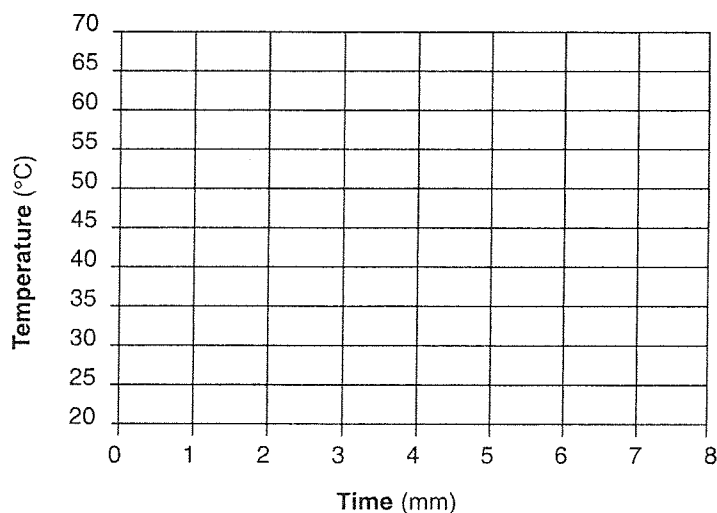
Time (min)	Temp (°C)
0	22
1	35
2	53
3	53
4	53
5	53
6	58
7	65

57.

Construct a line graph on the grid provided by following the steps below:

a Use an **X** to plot the temperature at each time shown on the chart.

b Connect the **Xs** with a solid line.



58.

Based on the data, at what temperature did a phase change take place?

Circle the correct answer: 35°C 53°C 58°C 65°C

59. Was energy absorbed or released by the material during the phase change from a solid to a liquid?

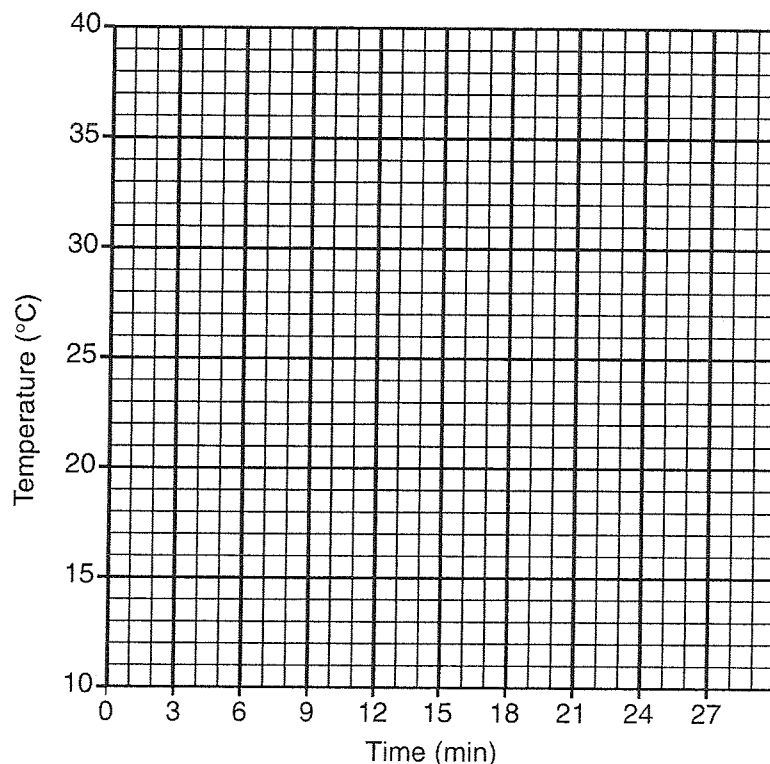
Circle the correct answer: absorbed released

60. What would be an appropriate title for this graph?

Base your answers to questions 61 through 65 on the experiment described below.

Heat was applied at a constant rate to a solid substance under controlled conditions. The temperature of the substance was recorded every 3 minutes. These data are recorded in the table below.

Time (min)	0	3	6	9	12	15	18	21	24	27
Temperature (°C)	12°	14°	16°	16°	16°	20°	24°	28°	32°	36°



61 Use the grid above to construct a line graph from the data in the table. Follow the steps below.

a Use Xs to plot the data for time and temperature.

b Draw a solid line that connects the Xs.

62 Provide an appropriate title for the graph.

Title: _____

63 According to your graph, what would the temperature of the substance be at 23 minutes?

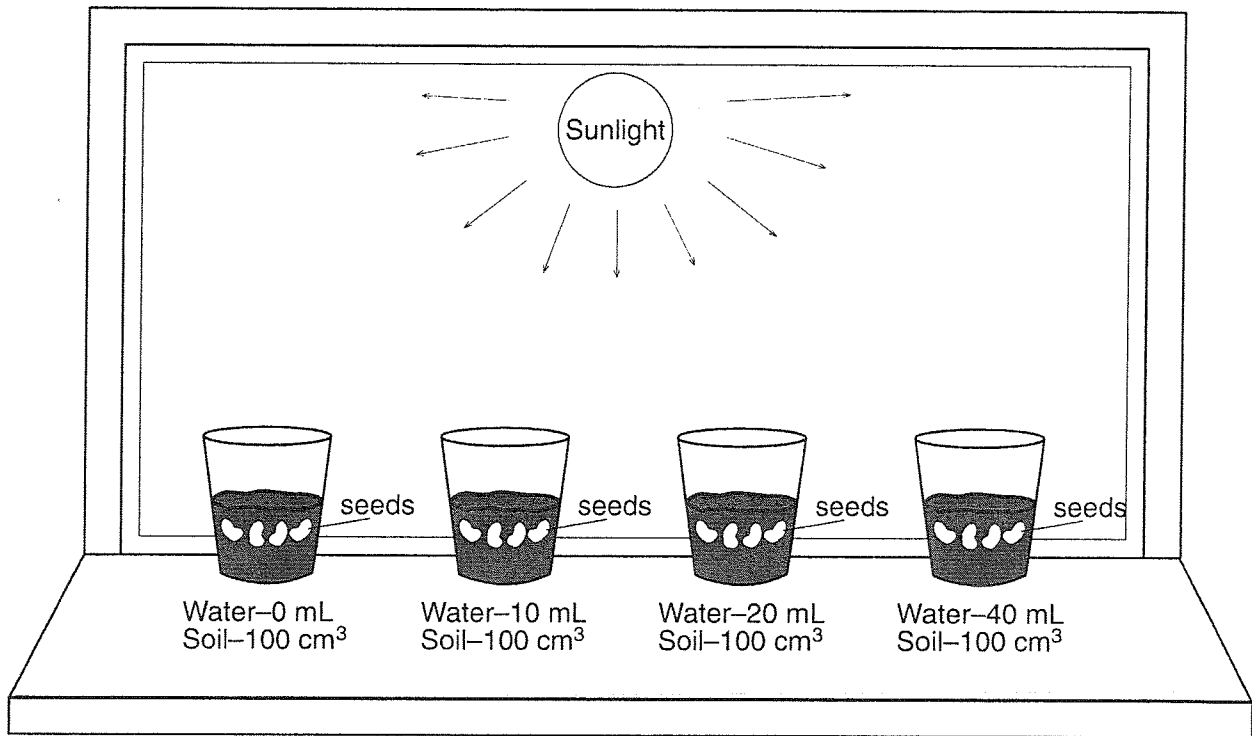
_____ °C

64 What is the independent (manipulated) variable in this experiment? _____

65 If heat was added at a constant rate to the solid substance, why did the temperature remain at 16°C for approximately 6 minutes?

Base your answers to questions 66 and 67 on the information and on the diagram below.

A student set up the experiment below to learn about plant growth. The student added a different amount of water to four identical containers, each containing four seeds in 100 cubic centimeters of soil. All of the containers were placed in the same sunny location.



66. State a hypothesis being tested in this experiment.

67. a Identify *one* variable that is being held constant in this experiment.

b Explain why this variable needs to be held constant.
